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Persiapan Proyek Akhir 1

1. Teori Singkat

Data warehouse adalah jenis sistem manajemen data yang dirancang untuk memungkinkan dan mendukung kegiatan business intelligence (BI), terutama analitik. Gudang data semata-mata dimaksudkan untuk melakukan kueri dan analisis dan sering berisi sejumlah besar data historis. Data dalam gudang data biasanya berasal dari berbagai sumber seperti file log aplikasi dan aplikasi transaksi. Gudang data memusatkan dan mengkonsolidasikan sejumlah besar data dari berbagai sumber. Kemampuan analitisnya memungkinkan organisasi untuk memperoleh wawasan bisnis yang berharga dari data mereka untuk meningkatkan pengambilan keputusan. Seiring waktu, ia membangun catatan sejarah yang dapat sangat berharga bagi para ilmuwan data dan analisis bisnis. Karena kemampuan ini, gudang data dapat dianggap sebagai "sumber kebenaran tunggal" organisasi.

2. Alat dan Bahan

Hardware : Laptop/PC

Software : Spoon Pentaho from Hitachi Vantara



3. Elemen Kompetensi

- a. Latihan pertama – Dim Date Transformation
 1. Buka XAMPP dan Nyalakan Apache serta MySQL lalu buka 127.0.0.1/phpMyAdmin pada browser anda dan buat database baru bernama classicmodels_dwh lalu import data SQL yang diberikan Asisten Laboratorium.



localhost / 127.0.0.1 | phpMyAdmin

localhost/phpmyadmin/server_databases.php?server=1

Server: 127.0.0.1

Databases SQL Status User accounts Export

Databases

Create database

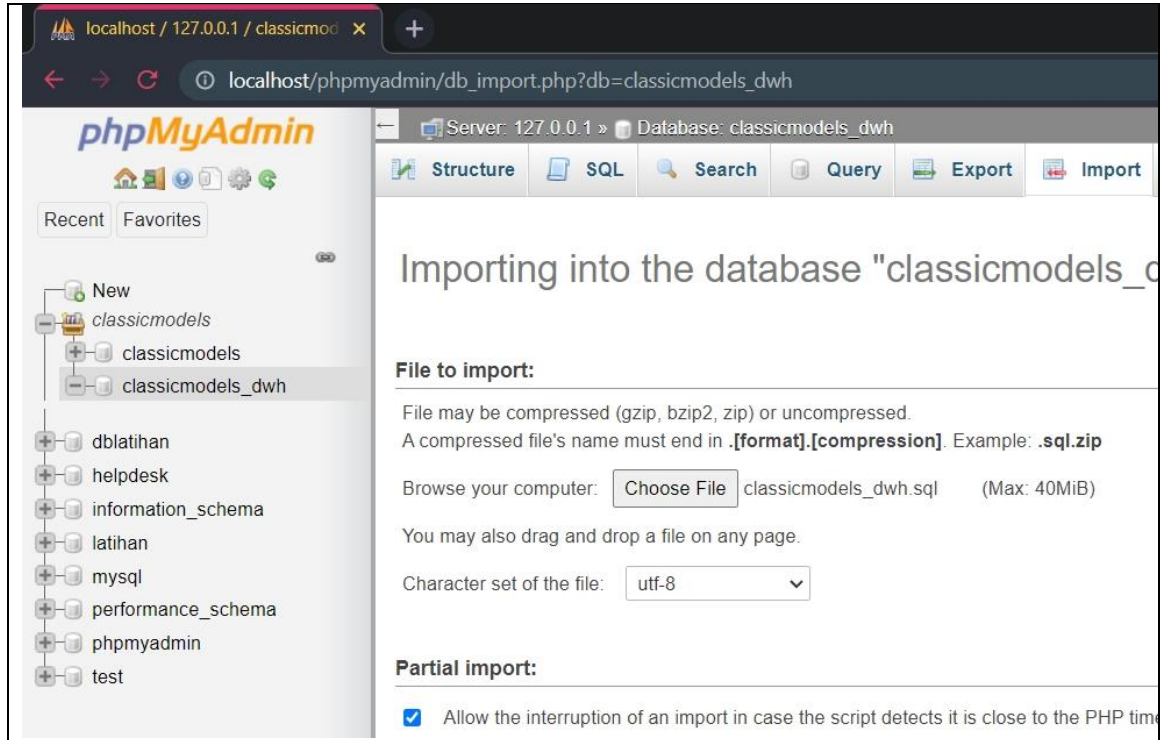
classicmodels_dwh utf8mb4_general_ci

Database	Collation	Action
<input type="checkbox"/> classicmodels	utf8mb4_general_ci	Check privileges
<input type="checkbox"/> dlatihan	utf8mb4_general_ci	Check privileges
<input type="checkbox"/> helpdesk	utf8mb4_general_ci	Check privileges
<input type="checkbox"/> information_schema	utf8_general_ci	Check privileges
<input type="checkbox"/> latihan	utf8mb4_general_ci	Check privileges
<input type="checkbox"/> mysql	utf8mb4_general_ci	Check privileges
<input type="checkbox"/> performance_schema	utf8_general_ci	Check privileges
<input type="checkbox"/> phpmyadmin	utf8_bin	Check privileges
<input type="checkbox"/> test	latin1_swedish_ci	Check privileges

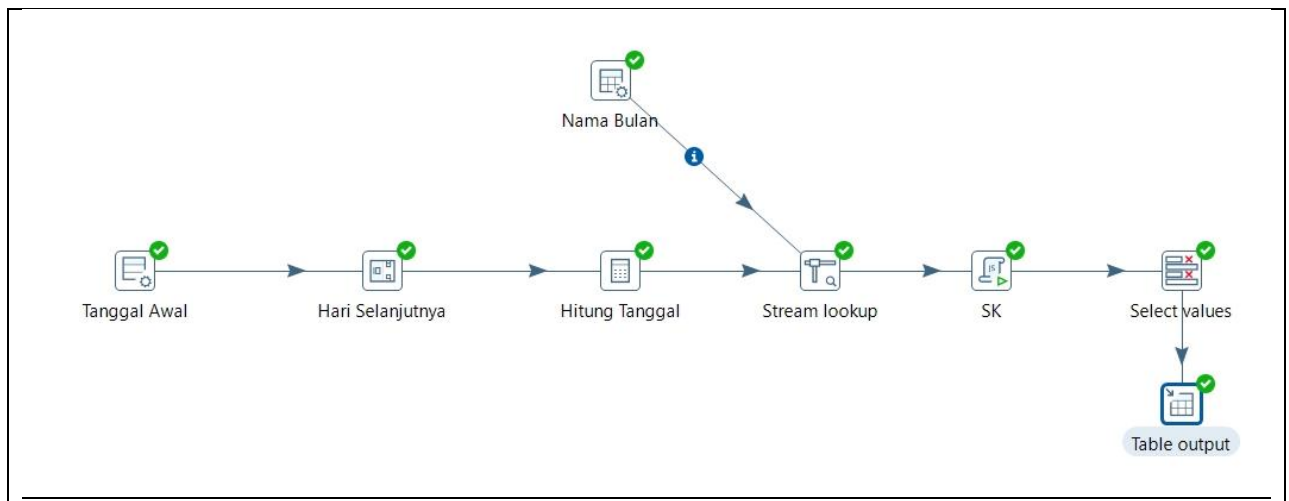
Total: 9

☐ Check all With selected: [Drop](#)





2. Struktur Dim Date



3. Tanggal Awal – Generate Rows



Generate rows

Step name: Tanggal Awal

Limit: 10000

Never stop generating rows: ☐

Interval in ms (delay): 5000

Current row time field name: now

Previous row time field name: FiveSecondsAgo

ields:

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Value	Set empty string?
1	tanggal_awal	Date	yyy-M...						2000-01-01	N

Help OK Preview Cancel

4. Hari Selanjutnya – Add sequence.

Add sequence

Step name: Hari Selanjutnya

Name of value: hari_selanjutnya

Use a database to generate the sequence

Use DB to get sequence? ☐

Connection: Edit... New... Wizard...

Schema name: Schemas...

Sequence name: SEQ Sequences...

Use a transformation counter to generate the sequence

Use counter to calculate sequence? ☒

Counter name (optional):

Start at value: 0

Increment by: 1

Maximum value: 999999999

Help OK Cancel

5. Hitung Tanggal – Calculator.



Calculator

Step name
Hitung Tanggal

☐ Throw an error on non existing files

Fields:

#	New field	Calculation	Field A	Field B	Field C	Value type	Length	Precision	Remove	Conversion mask	Decimal symbol	Grouping symbol	Currency s
1	date	Date A + B ...	tanggal...	hari_sel...		Date			N	yyyy-MM-dd			
2	year	Year of date...	date			Integer			N				
3	quarter_int	Quarter of d...	date			Integer			Y	0			
4	quarter_constant	Set field to ...	Q			String			Y				
5	quarter	A + B	quarter...	quarter...		String			N				
6	month	Month of d...	date			Integer			N				
7	day	Day of mon...	date			Integer			N				

6. Nama Bulan – Data Grid.

Data grid

Step name Nama Bulan

Meta Data

#	Name	Type	Format	Length	Precision	Currency	Decimal	Group	Null if	Set empty string?
1	month_number	Integer								N
2	month_name	String								N

Data grid

Step name Nama Bulan

Meta Data

#	month_number	month_name
1	1	Januari
2	2	Februari
3	3	Maret
4	4	April
5	5	Mei
6	6	Juni
7	7	Juli
8	8	Agustus
9	9	September
1..	10	Oktober
1..	11	November
1..	12	Desember



7. Lookup Nama Bulan – Stream lookup.

Stream lookup

Step name: Lookup Nama Bulan

Lookup step: Nama Bulan

The key(s) to look up the value(s):

#	Field	LookupField
1	month	month_numb...

Specify the fields to retrieve :

#	Field	New name	Default	Type
1	mont...			String

Preserve memory (costs CPU) ☒

Key and value are exactly one integer field ☐

Use sorted list (i.s.o. hashtable) ☐

? Help OK Cancel Get Fields Get lookup fields

8. SK – Modiefied JavaScript value.



Modified JavaScript value

Step name: SK

Java script functions :

- Transform Scripts
- Transform Constant
- Transform Function
- Input fields
 - tanggal_awal
 - hari_selanjutnya
 - date
 - year
 - quarter
 - month
 - day
 - month_name
- Output fields
 - Please use the 'F' key to search for fields

Java script :

Script 1

```
var sk;
sk = (year * 10000) + (month * 100) + day;
```

Position: 3, 42

Compatibility mode? ☐ Optimization level: 9

Fields

#	Fieldname	Rename to	Type	Length	Precision	Replace value 'Fieldname' or 'Rename to'
1	sk		Integer			N

Buttons: ? Help, OK, Cancel, Get variables, Test script

9. Select values

Select values

Step name: Select values

Select & Alter | Remove | Meta-data

Fields :

#	Fieldname	Rename to	Length	Precision
1	sk			
2	date			
3	year			
4	year			
5	quarter			
6	month			
7	month_name			
8	day			

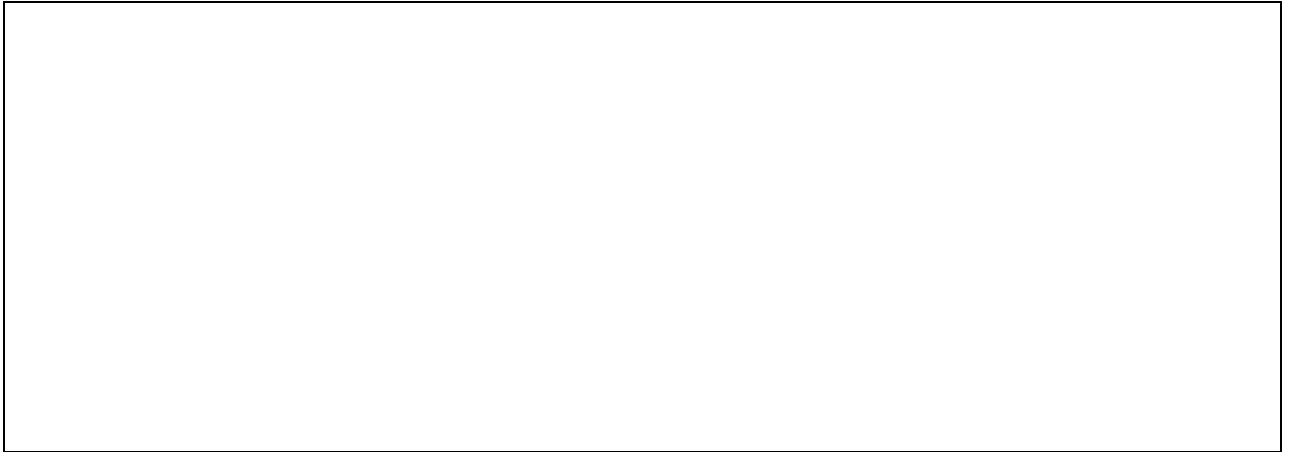
Buttons: Get fields to select, Edit Mapping

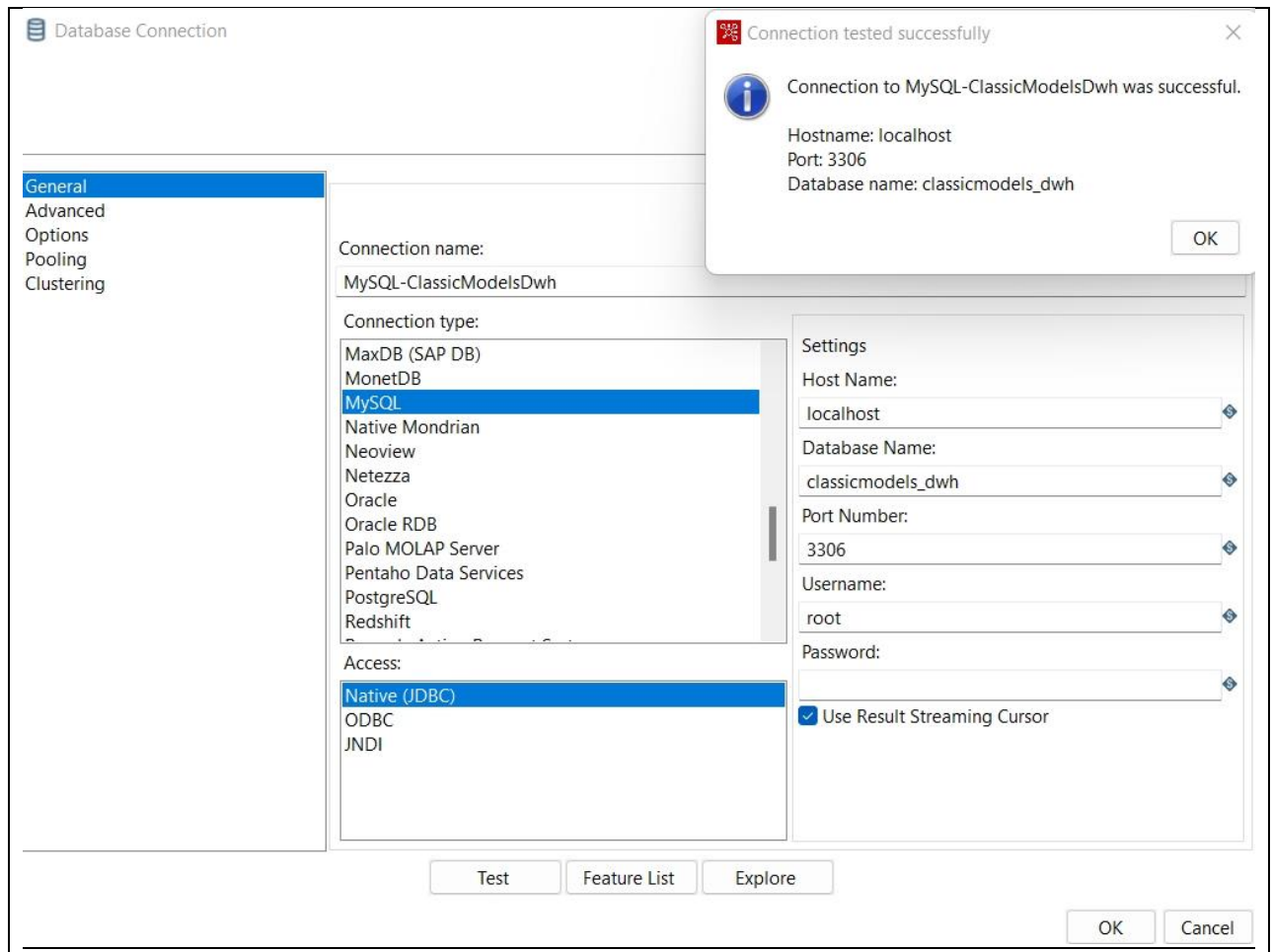
Include unspecified fields, ordered by name ☐

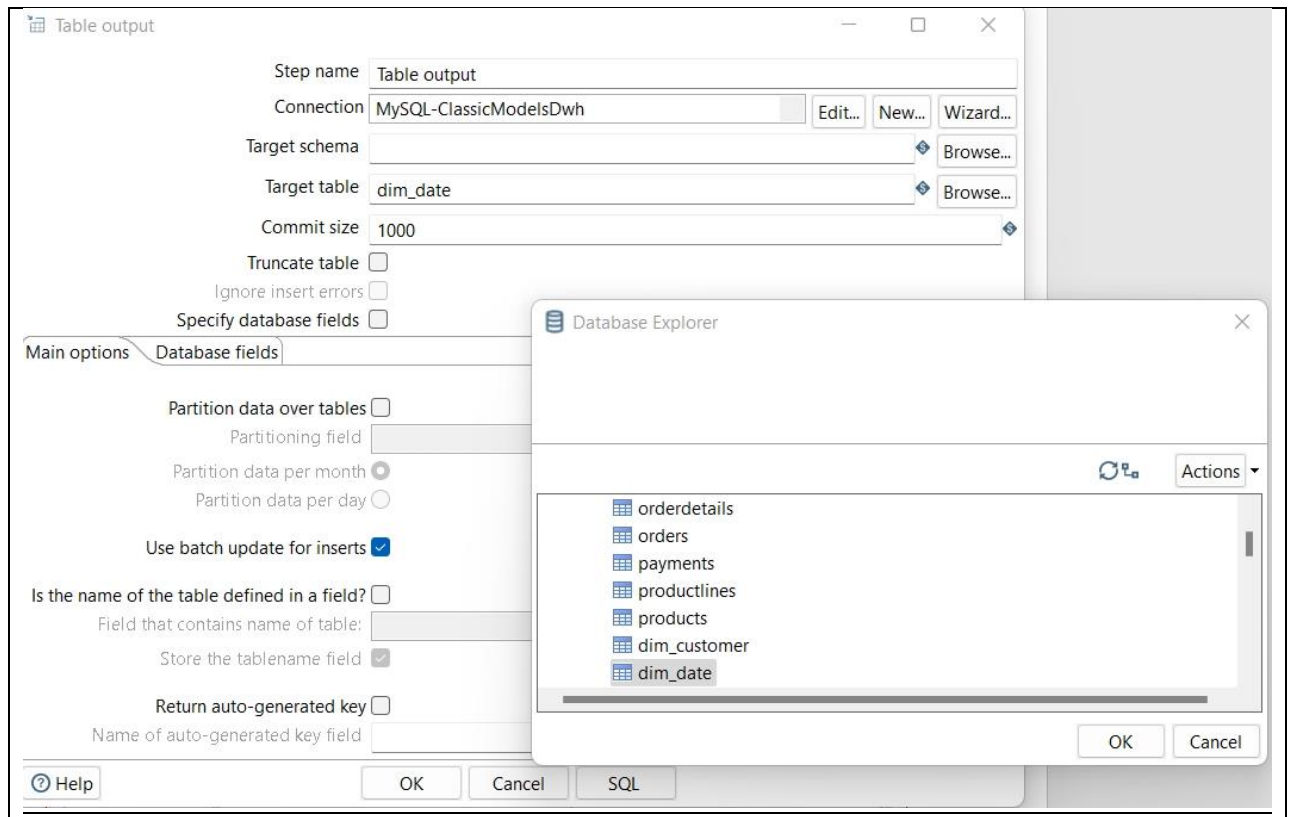
Buttons: ? Help, OK, Cancel

10. Table output

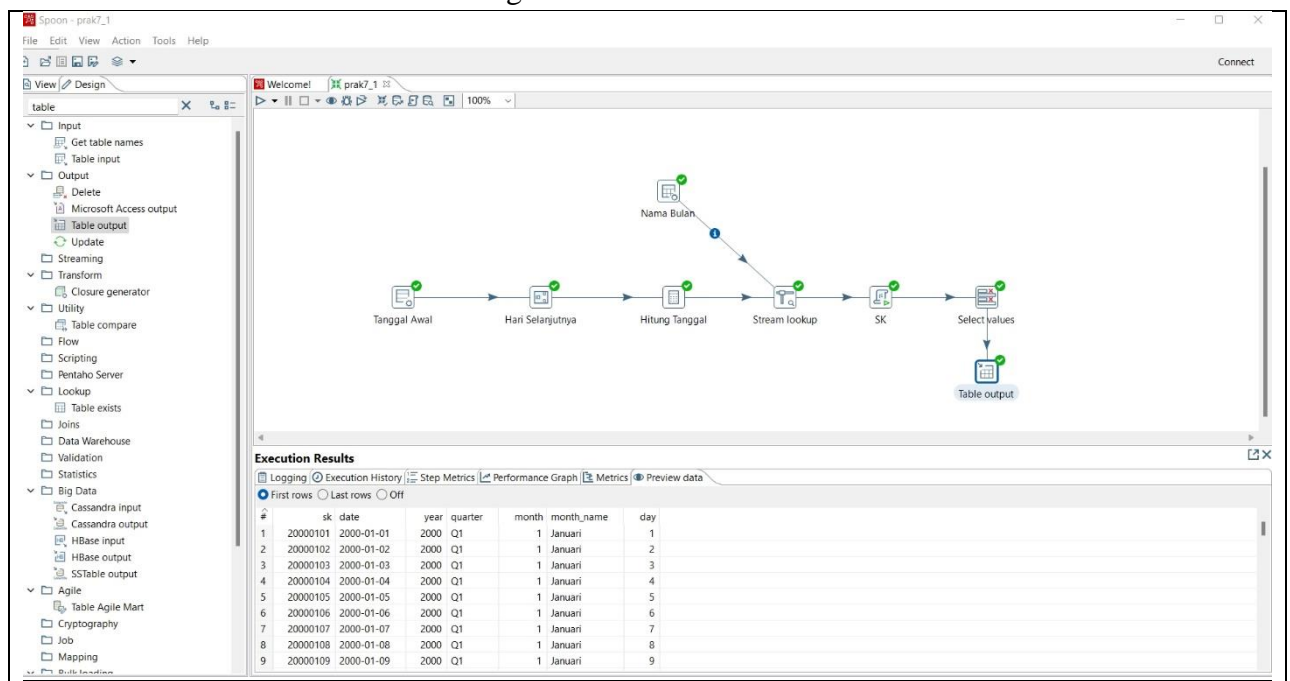






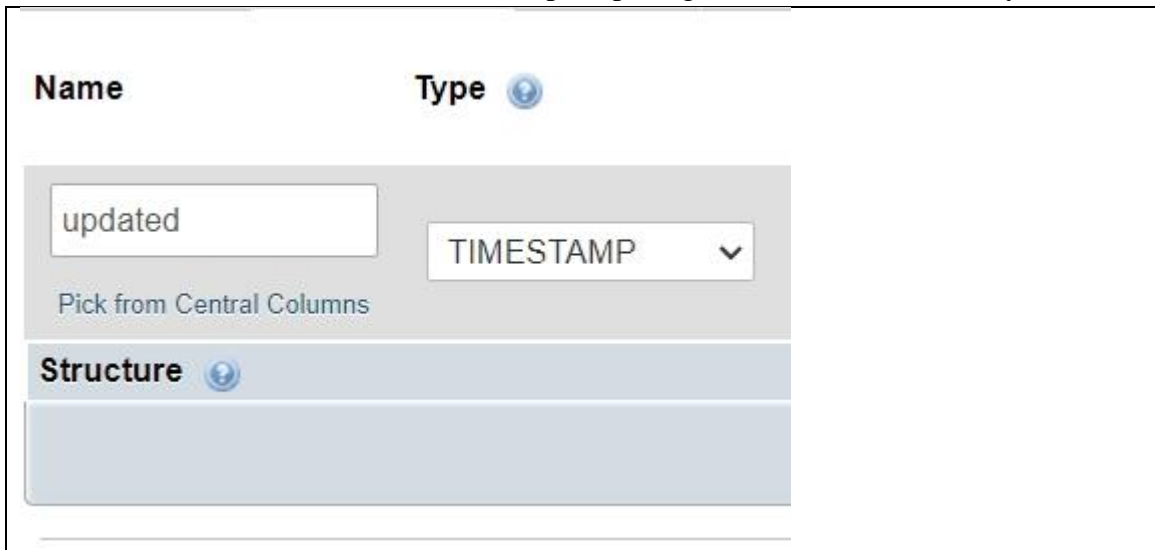


11. Ketika berhasil di Jalankan/Running



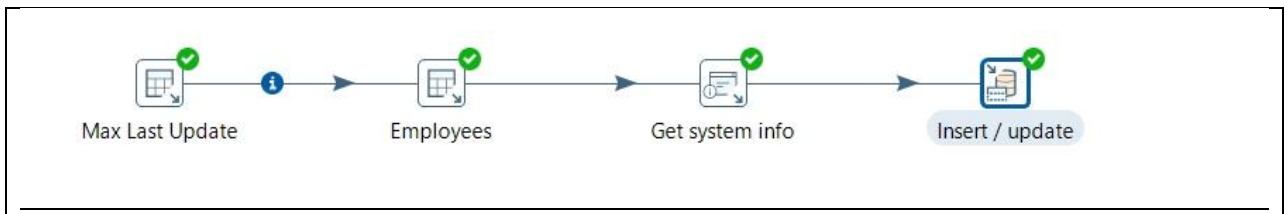
b. Latihan Kedua – Dim Customer Transformation

1. Tambahkan kolom baru bernama updated dengan tipe data timestamp pada tabel customer dalam database classicmodels seperti pada gambar dibawah ini di MySQL.



The screenshot shows the MySQL Workbench interface for adding a new column. The 'Name' field contains 'updated' and the 'Type' dropdown is set to 'TIMESTAMP'. Below the fields is a button labeled 'Pick from Central Columns'. The 'Structure' tab is selected, showing a table structure with one column.

2. Struktur Dim Customer



3. Max Last Update – Table input.

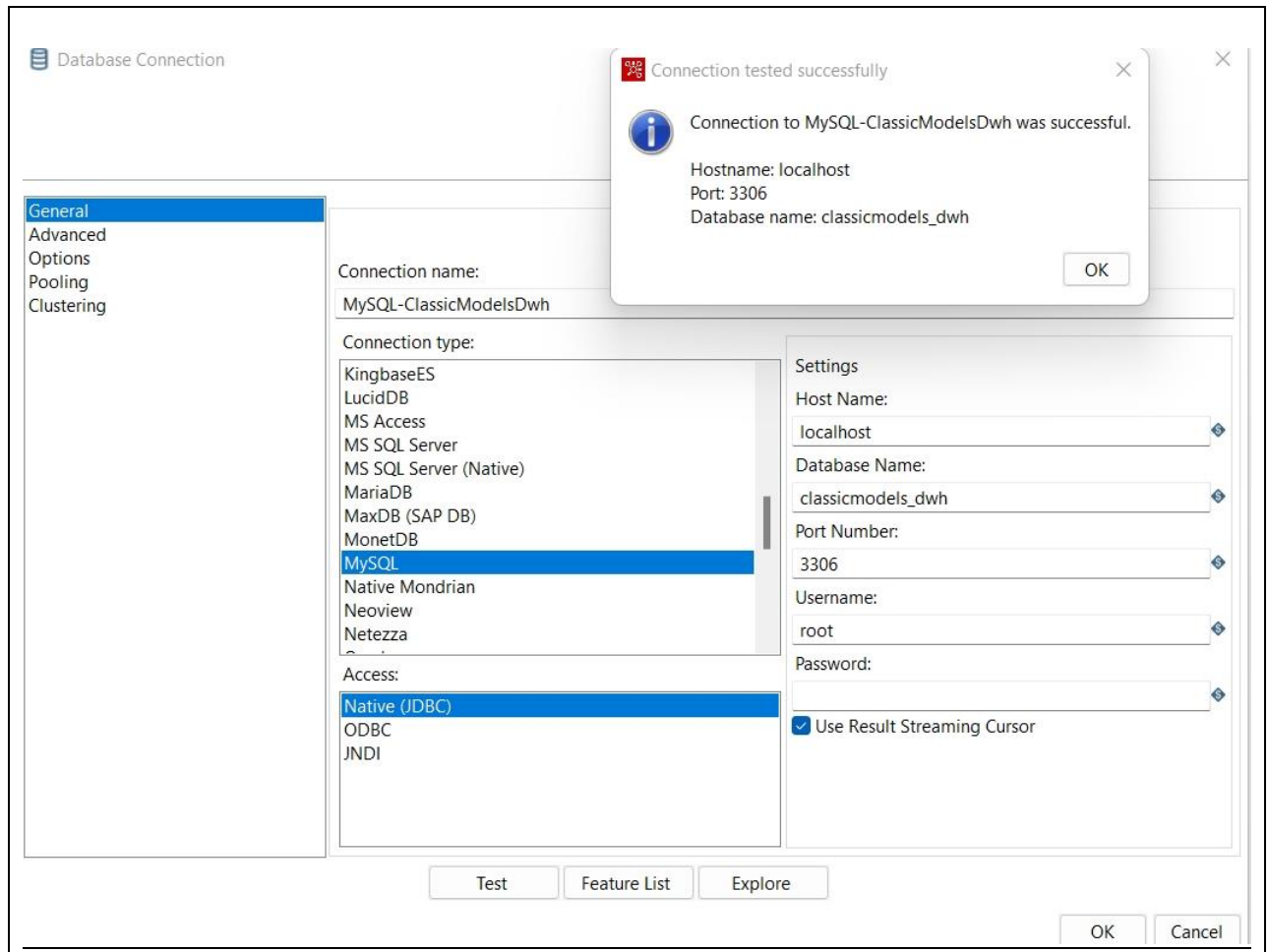


Table input

Step name: Max Last Update

Connection: MySQL-ClassicModelsDwh Edit... New... Wizard...

SQL Get SQL select statement...

```
SELECT  
COALESCE(  
    MAX(last_update),  
    '1970-01-01 00:00:00'  
) max_last_update  
FROM dim_customer
```

Line 6 Column 17

Store column info in step meta ☐

Enable lazy conversion ☐

Replace variables in script? ☐

Insert data from step

Execute for each row? ☐

Limit size: 0

Help OK Preview Cancel

4. Employees – Table input.



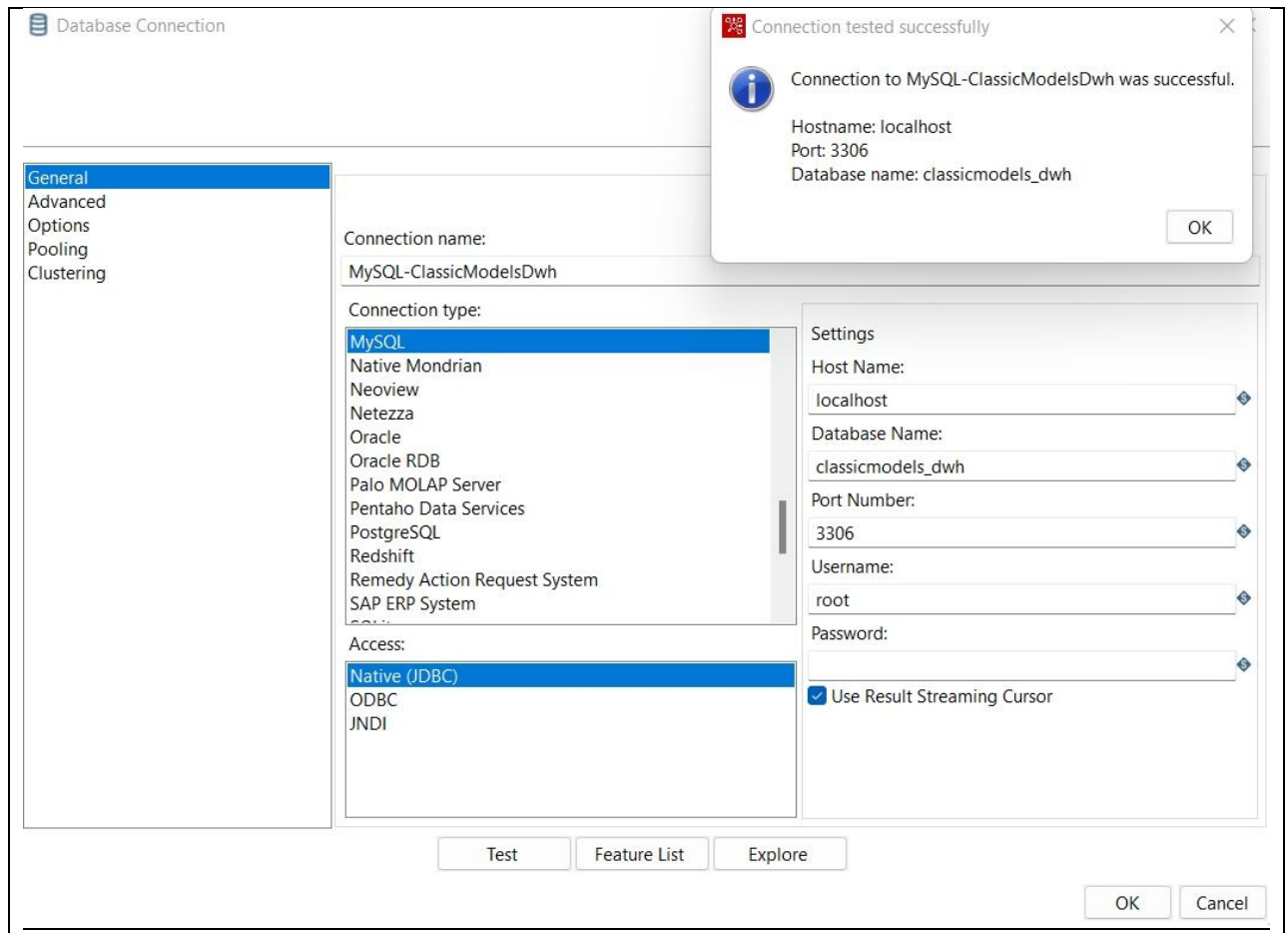


Table input

Step name: Employees

Connection: MySQL-ClassicModelsDwh

Buttons: Edit... New... Wizard...

SQL: Get SQL select statement...

```

SELECT
c.customerNumber AS customer_number,
c.customerName AS customer_name,
c.phone AS phone,
CONCAT(COALESCE(c.addressLine1, ''),
CASE WHEN (ISNULL(c.addressLine2)) THEN '' ELSE '' END,
COALESCE(c.addressLine2, '')) AS address,
c.city AS city,
c.state AS state,
c.postalcode AS postal_code,
c.country AS country,
c.salesRepEmployeeNumber AS sales_rep_employee_number,
CONCAT(COALESCE(e.firstName, ''),
CASE WHEN (ISNULL(e.lastName)) THEN '' ELSE '' END,
COALESCE(e.lastName, '')) AS sales_rep_employee_name,
c.creditLimit AS credit_limit
FROM customers c
LEFT JOIN employees e ON c.salesRepEmployeeNumber = e.employeeNumber
WHERE c.updated > ?

```

line 19 Column 19

Store column info in step meta ☐

Enable lazy conversion ☐

Replace variables in script? ☒

Insert data from step: Max Last Update

Execute for each row? ☐

Limit size: 0

Buttons: ? Help OK Preview Cancel

5. Get System Info

Get system info

Step name: Get system info

Fields:

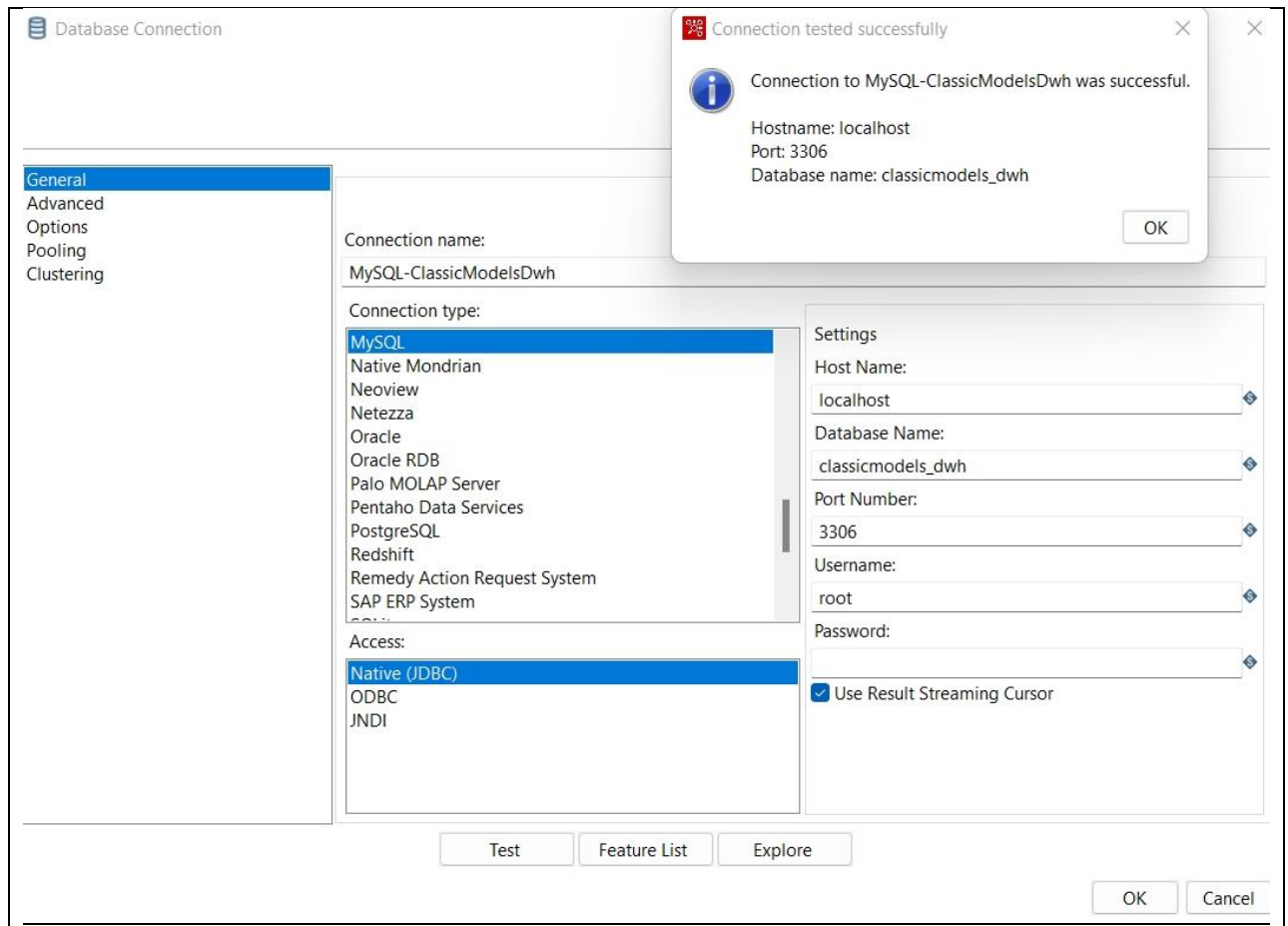
#	Name	Type
1	last_update	syste...

Buttons: ? Help OK Preview rows Cancel



6. Insert / Update.





Insert / update

Step name

Insert / update

Connection

MySQL-ClassicModelsDwh

Edit...

New...

Wizard...

Target schema

Browse...

Target table

dim_customer

Browse...

Commit size

100

Don't perform any updates:

☐

The key(s) to look up the value(s):

#	Table field	Comparator	Stream field1	Stream field2
1	customer_n...	=	customer_num...	
2	customer_n...	=	customer_name	
3	phone	=	phone	

Get fields

Update fields:

#	Table field	Stream field	Update
1	customer_n...	customer_nu...	
2	customer_n...	customer_na...	
3	phone	phone	
4	address	address	
5	city	city	
6	state	state	
7	postal_code	postal_code	
8	country	country	
9	sales_rep_e...	sales_rep_em...	
1..	sales_rep_e...	sales_rep_em...	
1..	credit_limit	credit_limit	
1..	last_update	last_update	

Get update fields

Edit mapping

Help

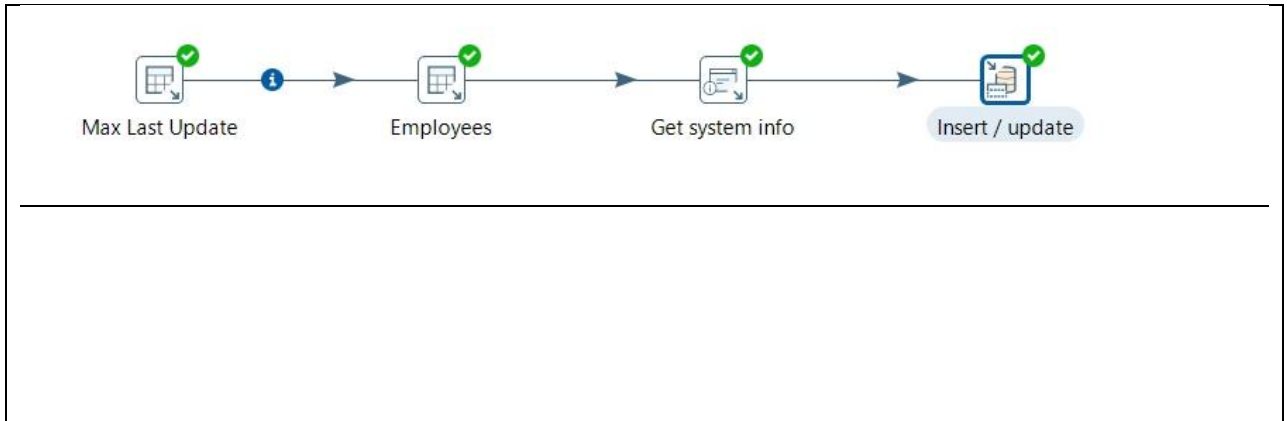
OK

Cancel

SQL



7. Lalu Jalankan maka hasilnya akan seperti ini.



c. Latihan Ketiga – Dim Employee Transformation

1. Tambahkan kolom baru bernama updated dengan tipe data timestamp pada tabel employees dalam database classicmodels seperti pada gambar dibawah ini di MySQL.

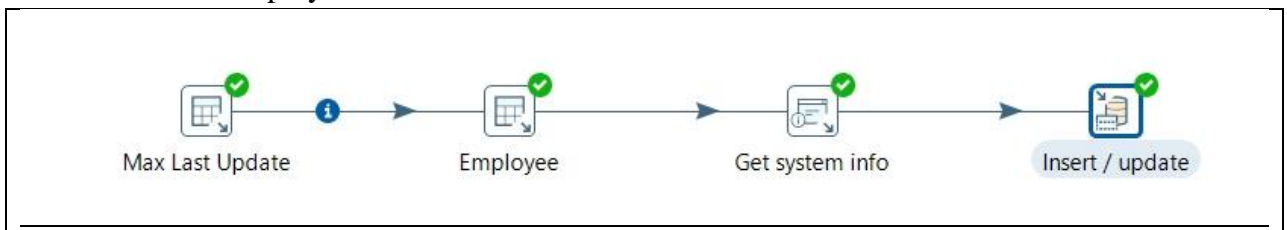
Name **Type** **?** **I**

updated TIMESTAMP

Pick from Central Columns

Structure **?**

2. Struktur Dim Employee



3. Max Last Update – Table input.

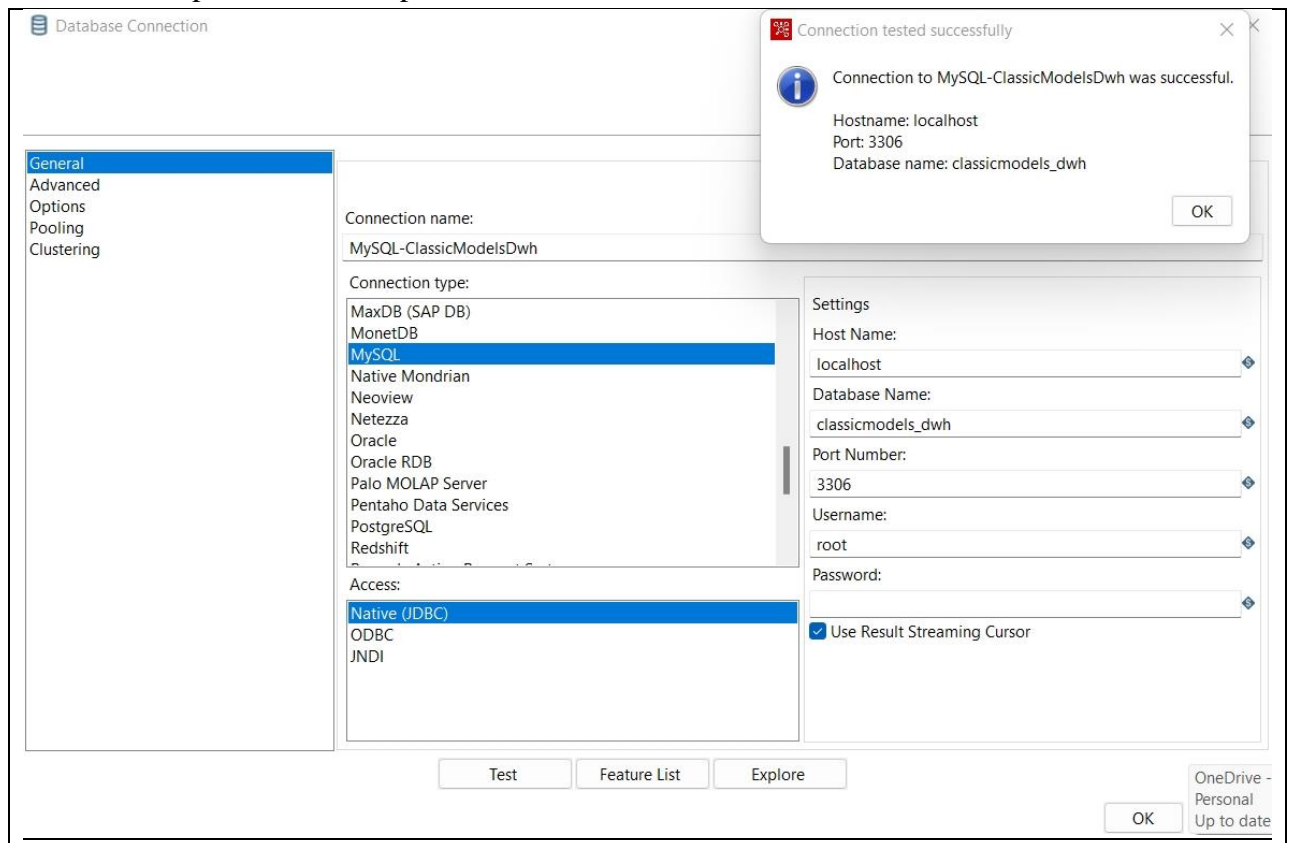


Table input

Step name: Max Last Update

Connection: MySQL-ClassicModelsDwh Edit... New... Wizard...

SQL Get SQL select statement...

```
SELECT  
COALESCE(  
    MAX(last_update),  
    '1970-01-01 00:00:00'  
) max_last_update  
FROM dim_employee
```

Line 6 Column 17

Store column info in step meta ☐

Enable lazy conversion ☐

Replace variables in script? ☐

Insert data from step

Execute for each row? ☐

Limit size: 0

Help OK Preview Cancel

4. Employee – Table input.



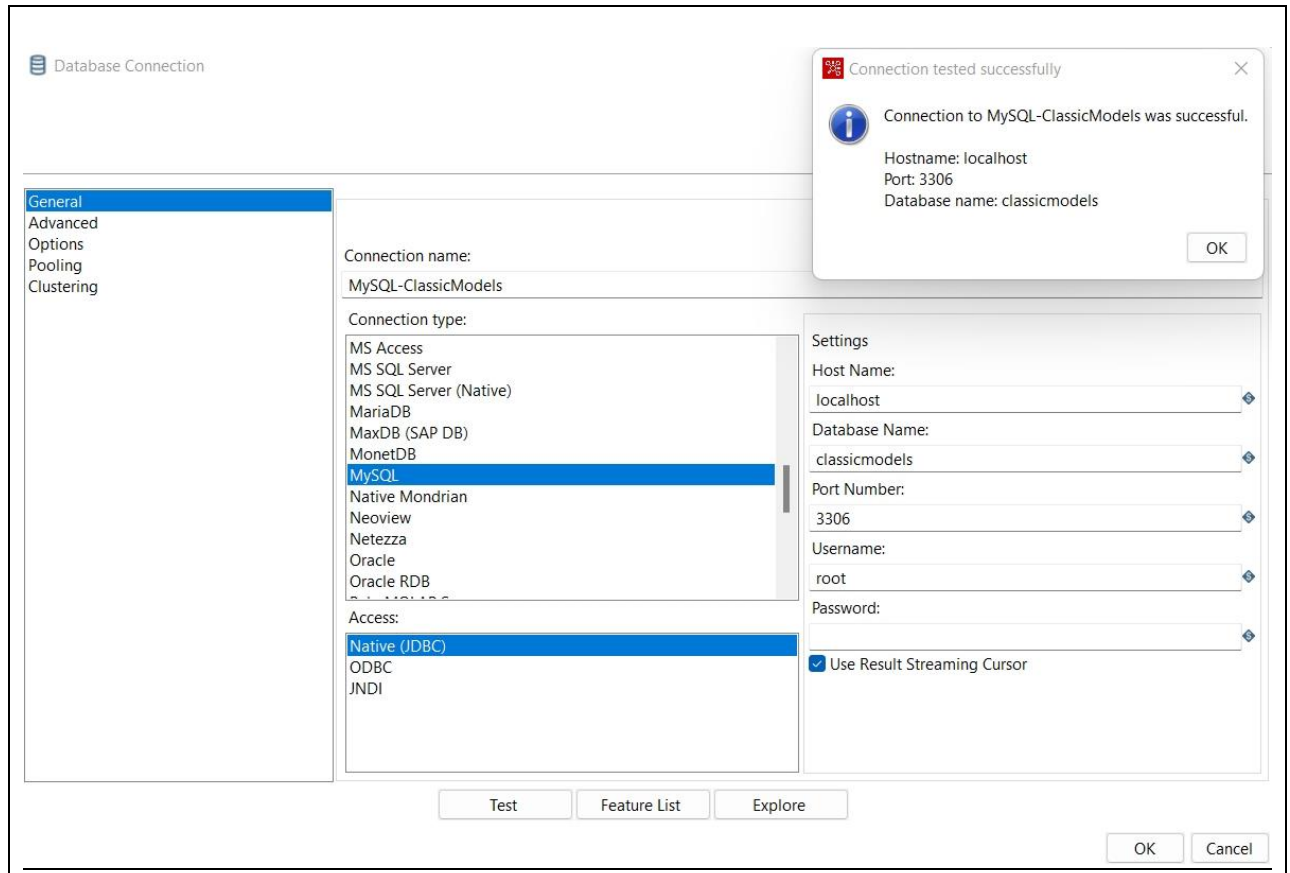


Table input

Step name Employee

Connection MySQL-ClassicModels Edit... New... Wizard...

SQL Get SQL select statement...

```
SELECT e.employeeNumber AS employee_number,  
CONCAT (COALESCE(E.firstName, ''),  
CASE WHEN (ISNULL(E.lastName)) THEN '' ELSE ' ' END,  
COALESCE(e.lastName, '')) AS employee_name,  
e.extension AS extension,  
e.email AS email,  
jobTitle AS job_title,  
o.officeCode AS office_code,  
CONCAT(COALESCE(o.addressLine1, ''),  
CASE WHEN (ISNULL(o.addressLine2)) THEN '' ELSE ' ' END,  
COALESCE(o.addressLine2, '')) AS office_address,  
o.city AS office_city,  
o.country AS office_country,  
o.postalCode AS office_postal_code,  
o.territory AS office_territory  
FROM employees e  
LEFT JOIN offices o ON o.officeCode = e.officeCode  
WHERE e.updated > ?
```

Line 18 Column 19

Store column info in step meta ☐

Enable lazy conversion ☐

Replace variables in script? ☒

Insert data from step Max Last Update

Execute for each row? ☐

Limit size 0

Help OK Preview Cancel

5. Get System Info



Get system info

Step name Get system info

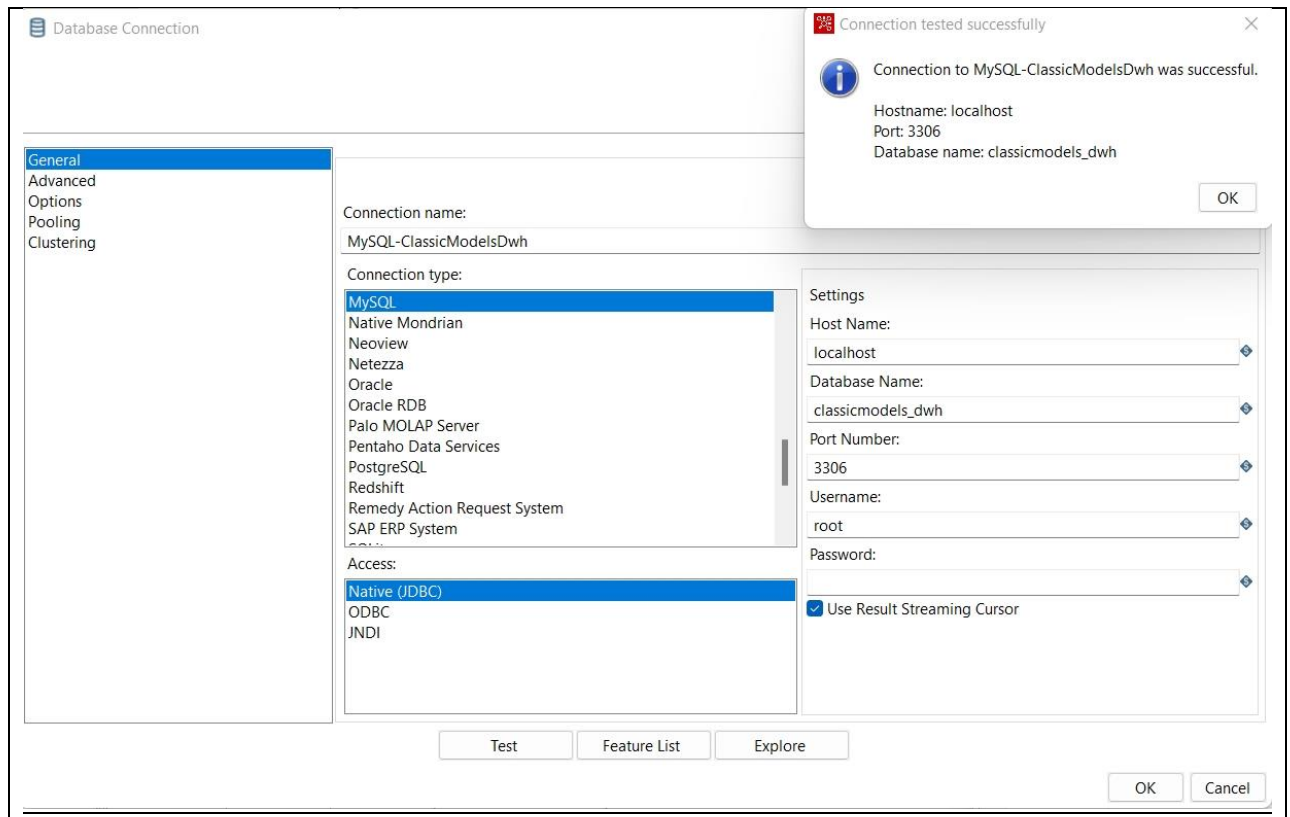
Fields:

#	Name	Type
1	last_update	syste...

Help OK Preview rows Cancel

6. Insert / Update





Insert / update

Step name

Insert / update

Connection

MySQL-ClassicModelsDwh

Edit...

New...

Wizard...

Target schema

Browse...

Target table

dim_employee

Browse...

Commit size

100

Don't perform any updates:

☐

The key(s) to look up the value(s):

#	Table field	Comparator	Stream field1	Stream field2
1	employee_...	=	employee_number	

Get fields

Update fields:

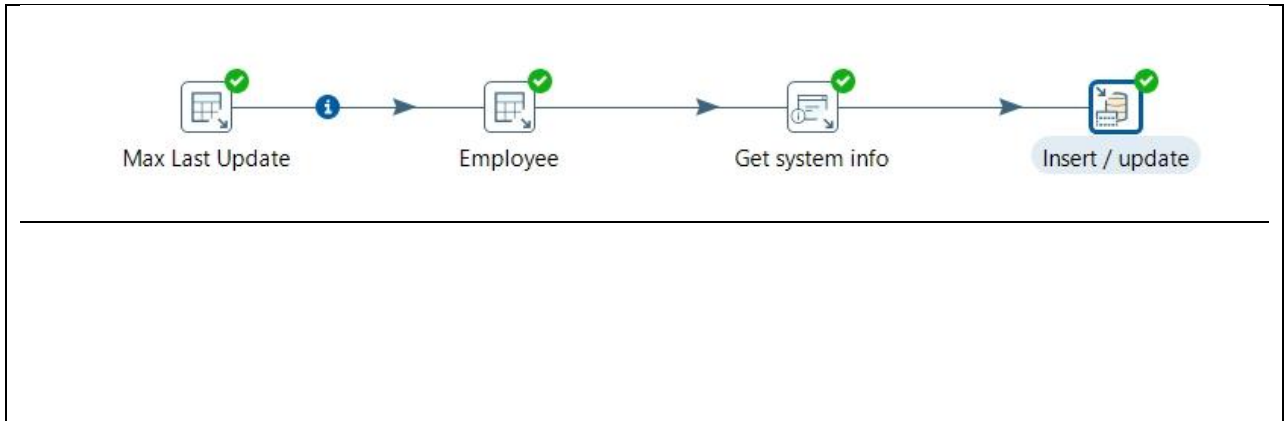
#	Table field	Stream field	Update
1	employee_number	employee_number	Y
2	employee_name	employee_name	Y
3	extension	extension	Y
4	email	email	Y
5	job_title	job_title	Y
6	office_code	office_code	Y
7	office_address	office_address	Y
8	office_city	office_city	Y
9	office_country	office_country	Y
1..	office_postal_code	office_postal_code	Y
1..	office_territory	office_territory	Y
1..	last_update	last_update	Y

Get update fields

Edit mapping



7. Output ketika di Running dan Dijalankan



4. File Praktikum

Github Repository:

<https://github.com/IbnuFajar7/Data-Warehouse/tree/main/Prak-7>

5. Soal Latihan

Soal:

1. Apa yang dimaksud dengan Dimensi dalam Data Warehouse?
2. Apa yang dimaksud dengan Skema dalam Data Warehouse?

Jawaban:

1. Dimensi adalah struktur yang mengkategorikan kumpulan informasi sehingga. Dimensi dalam manajemen data dan data warehouse (gudang data) berisi data yang relatif statis. Namun data dari dimensi dapat berubah secara perlahan dari waktu ke waktu dan pada interval yang tidak dapat diprediksi.
2. Terdapat tiga skema dalam data warehouse, yaitu Star Schema, Snowflake Schema, dan Galaxy Schema. merupakan skema paling sederhana yang memiliki satu tabel tengah yaitu tabel fakta dimana tabel tersebut terhubung dengan beberapa dimensi tabel lainnya.

6. Kesimpulan

- a. Dalam pengerjaan praktikum Data Warehouse, kita harus benar-benar teliti dalam menginputkan suatu fungsi untuk menampilkan suatu keluaran pada layar dengan sesuai.
- b. Kita dapat mengetahui bahwa dalam praktikum ini kita bisa mengupdate suatu data dalam bentuk skema dan dimensi dalam aplikasi yang memudahkan kita untuk mengolah data update tersebut secara langsung bersamaan tanpa satu persatu mengupdate data tersebut.

7. Cek List (✓)

No	Elemen Kompetensi	Penyelesaian	
		Selesai	Tidak Selesai



1.	Latihan Pertama	✓	
2.	Latihan Kedua	✓	
3.	Latihan Ketiga	✓	

8. Formulir Umpan Balik

No	Elemen Kompetensi	Waktu Pengerjaan	Kriteria
1.	Latihan Pertama	30 Menit	1
2.	Latihan Kedua	30 Menit	1
3.	Latihan Ketiga	30 Menit	1

Keterangan:

1. Menarik
2. Baik
3. Cukup
4. Kurang

